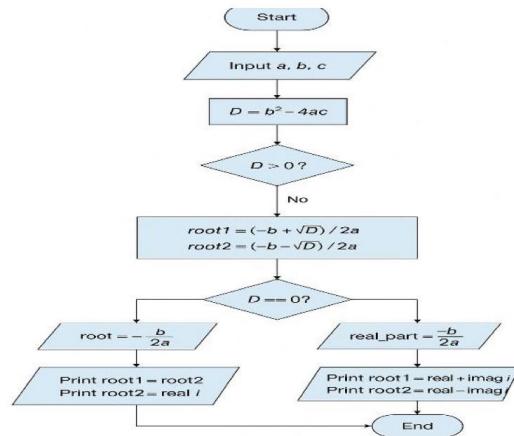


### PROBLEM 2.1.1

#### Flowchart



#### Algorithm

### Start

**Input:** Read three integers (a, b, and c) from a single line of input.

**Calculate Discriminant:** Compute D using the formula:  $D = b^2 - 4ac$

- **If  $D > 0$  (Real and Different):**
  - Calculate  $\text{root1} = \frac{-b + \sqrt{D}}{2a}$
  - Calculate  $\text{root2} = \frac{-b - \sqrt{D}}{2a}$
  - Print both roots.
- **If  $D = 0$  (Real and Same):**
  - Calculate the single root:  $\text{root} = \frac{-b}{2a}$
  - Print that  $\text{root1} = \text{root2}$  equals this value.
- **If  $D < 0$  (Imaginary/Complex):**
  - Calculate the **Real Part**:  $\frac{-b}{2a}$
  - Calculate the **Imaginary Part**:  $\frac{\sqrt{-D}}{2a}$
  - Print the roots in the complex format (e.g.,  $\text{real} + \text{imaginary}i$ ).

**Formatting:** Ensure all printed values are formatted to exactly **two decimal places**.

### Stop

**CODETANTRA** Home

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2.1. Roots of a Quadratic Equation

Write a program to find the roots of a quadratic equation, given its coefficients a, b, and c. Use the quadratic formula:  $\frac{(-b \pm \sqrt{b^2 - 4ac})}{2a}$

The discriminant  $D = b^2 - 4ac$  determines the nature of the roots:

- If  $D > 0$ : Roots are real and different
- If  $D = 0$ : Roots are real and the same
- If  $D < 0$ : Roots are imaginary

**Input Format:**

- Three space-separated integers representing the coefficients a, b, and c, respectively.

**Output Format:**

- If roots are real and different, print:

```

import math
a, b, c = map(int, input().split())
D = b * b - 4 * a * c
if D > 0:
    root1 = (-b + math.sqrt(D)) / (2 * a)
    root2 = (-b - math.sqrt(D)) / (2 * a)
    print(root1)
    print(root2)
else:
    real_part = -b / (2 * a)
    imag_part = math.sqrt(-D) / (2 * a)
    print(real_part + imag_part * 1j)
print("== YOUR PROGRAM HAS ENDED ==")

```